

**(57) Abstract:** An apparatus and method for forming or repairing a wellbore casing (210) by radially expanding a tubular liner (125).



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NE, SN, TD, TG).

*with amended claims*

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*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

## AMENDED CLAIMS

[received by the International Bureau on 28 February 2003 (28.02.03);  
original claims 1 and 5 replaced by amended claims 1 and 5; original claims 3 and 7 cancelled;  
new claims 8-10 added; remaining claims unchanged (3 pages)]

1. A method of coupling a radially expandable tubular member to a preexisting structure, comprising:  
positioning the tubular member within the preexisting structure;  
injecting fluidic materials into the tubular member;  
sensing the operating pressure of the fluidic materials;  
radially expanding and plastically deforming the tubular member into contact with the preexisting structure when the sensed operating pressure exceeds a predetermined amount;  
radially expanding and plastically deforming the tubular member using a tubular expansion cone when the sensed operating pressure exceeds the predetermined amount; and  
movably coupling a tubular shoe to the tubular expansion cone.
2. The method of claim 1, wherein sensing the operating pressure includes:  
sensing the operating pressure of the fluidic materials within the tubular member.
3. Cancelled
4. An apparatus for coupling a radially expandable tubular member to a preexisting structure, comprising:  
a tubular support member including a first passage;  
a tubular expansion cone coupled to the tubular support member defining a second passage and including an internal flange;  
a tubular shoe movably received within the second passage of the tubular expansion cone defining one or more radial passages and a valveable passage fluidically coupled to the first passage and including an external flange for engaging the internal flange;  
one or more pressure relief valves positioned in corresponding ones of the radial passages;  
and an expandable tubular member movably coupled to the tubular expansion cone.
5. A system for coupling a radially expandable tubular member to a preexisting structure, comprising:  
means for positioning the tubular member within the preexisting structure;  
means for injecting fluidic materials into the tubular member;  
means for sensing the operating pressure of the fluidic materials;

means for radially expanding the tubular member into contact with the preexisting structure when the sensed operating pressure exceeds a predetermined amount; and

means for radially expanding and plastically deforming the tubular member using a tubular expansion cone when the sensed operating pressure exceeds the predetermined amount; and

means for movably coupling a tubular shoe to the tubular expansion cone.

6. The system of claim 5, wherein the means for sensing the operating pressure includes:  
means for sensing the operating pressure of the fluidic materials within the tubular member.

7. Cancelled

8. A method of coupling a radially expandable tubular member to a preexisting structure, comprising:

positioning the tubular member within the preexisting structure;

injecting fluidic materials into the tubular member;

sensing the operating pressure of the fluidic materials;

radially expanding and plastically deforming the tubular member into contact with the preexisting structure when the sensed operating pressure exceeds a predetermined amount; and

radially expanding and plastically deforming the tubular member by displacing an expansion member in the longitudinal direction relative to the tubular member when the sensed operating pressure exceeds the predetermined amount.

9. A system for coupling a radially expandable tubular member to a preexisting structure, comprising:

means for positioning the tubular member within the preexisting structure;

means for injecting fluidic materials into the tubular member;

means for sensing the operating pressure of the fluidic materials; [and]

means for radially expanding the tubular member into contact with the preexisting structure when the sensed operating pressure exceeds a predetermined amount; and

means for radially expanding and plastically deforming the tubular member member by displacing an expansion member in the longitudinal direction relative to the tubular member when the sensed operating pressure exceeds the predetermined amount.

10. An apparatus for coupling a radially expandable tubular member to a preexisting structure, comprising:

a support member; and

an expansion device movably coupled to the support member comprising:  
one or more expansion surfaces adapted to be displaced in the longitudinal direction relative to the support member for engaging and radially expanding and plastically deforming the expandable tubular member; and  
one or more pressure sensing elements coupled to the expansion surfaces for controlling the longitudinal displacement of the expansion surfaces as a function of the sensed operating pressure within the expandable tubular member.